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# Emotion regulation therapy for cancer caregivers—an open trial of a mechanism-targeted approach to addressing caregiver distress

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## Abstract

Informal caregivers (ICs) are integral to care provided to patients facing life-threatening or incurable illnesses. This responsibility causes considerable burden, as approximately one half of ICs report clinically significant symptoms of depression and/or anxiety that persist when left untreated. Psychosocial interventions containing efficacious treatment principles (e.g., cognitive behavior therapy [CBT]) show disappointing results in reducing anxiety and depression in ICs. This may reflect failure of these interventions to specifically target crucial mechanisms underlying the central feature of distress caused by the patient's illness—notably, perseverative negative thinking (PNT). Emotion Regulation Therapy (ERT) is an efficacious CBT developed to explicitly target mechanisms underlying PNT and the emotional concomitants that arise in response to stressful situations. This open trial was conducted to evaluate the acceptability and initial efficacy of ERT adapted to the experience of cancer ICs (ERT-C). Thirty-one ICs provided informed consent and completed eight weekly individual sessions of ERT-C. Participants completed self-report measures of depression and anxiety symptoms, PNT, emotion regulation deficits, and caregiver burden before and after treatment. ERT-C was well tolerated as indicated by 22 treatment completers and feedback provided in exit interviews. ICs demonstrated reduced depression and anxiety symptoms, PNT, and emotion regulation deficits with moderate to large effect sizes (Hedge's *g* range: 0.36–0.92). Notably, caregiver burden was not reduced but ICs expressed more ability to confront caregiving-related challenges. Findings offer promising but preliminary support for ERT-C as a conceptual model and treatment modality for distressed cancer ICs.

## Keywords

Informal caregivers, Cancer, Distress, Emotion regulation therapy, Perseverative negative thinking

## INTRODUCTION

Informal caregivers (ICs) are relatives, partners, or friends who have a significant relationship with and provide assistance (i.e., physical, emotional) to a patient with often life-threatening and/or incurable illnesses [1]. In 2016, over 65 million people in the USA served as ICs for medically ill relatives, including nearly 5 million patients with cancer [1]. This number may reflect the rising cost of health care, which places the responsibility of caring for the chronically medically ill on ICs [2]. Consequently, attention to the unique burden of ICs is needed, not only for their benefit, but also for the patient

### Implications

**Practice:** Describing Emotion Regulation Therapy for Cancer Caregivers (ERT-C) will inform practitioners considering how to best support cancer caregivers experiencing significant distress as a result of the caregiving role.

**Policy:** The development of targeted, efficacious and time-limited support programs are needed to address the multiple concerns of a large number of caregivers.

**Research:** Further research is needed to establish the efficacy of ERT-C using a randomized controlled trial (RCT) design. Longer follow-up periods and larger sample sizes would allow for rich assessment of psychological, biological and physiological mechanisms underlying the changes resulting from ERT-C.

whose care is highly impacted by their IC's well-being [3, 4]. Indeed, attending to the psychosocial needs of ICs is increasingly seen as crucial element of comprehensive care for patients with cancer.

The extant literature documents high levels of psychological distress among cancer ICs, among whom over half report clinically significant symptoms of depression and/or anxiety [5–10]. When examined prospectively, rates of anxiety and depression among cancer ICs increase over time if left untreated [11]. Chronic distress associated with caregiving increases risk for medical complications among ICs, including poor immune functioning, cardiovascular disease, and sleep difficulties [12, 13]. The impact of distress may also contribute to dysregulation in biological processes, such as diurnal cortisol rhythm [14] and pro-inflammatory cytokine activation [15].

Distress is commonly defined as prolonged internal suffering that can range from self-focused processing of negative emotions and stressors, to highly intensely aversive and prolonged processing

of emotional states [16]. Distress can be brought on by attention to cues of threat and reward related to some actual or perceived stressful situation and is, subsequently, worsened and prolonged when individuals engage in perseverative negative thinking (PNT) [17], such as worry, depressive rumination, and self-criticism. PNT refers to mental activity that arises when individuals experience a discrepancy between their current emotional/motivational state and a representation of the future (i.e., planning), the past (i.e., failures/losses), or an idealized self (i.e., self-criticism).

Although the term PNT is not specifically used in the caregiving literature, the scope of what PNT references is well documented among ICs. Beyond the news that a loved one has received a cancer diagnosis, providing care for a loved one is fundamentally characterized by conflicting emotional and motivational states. Cancer ICs may concurrently wish for a happy future with their loved ones while engaging in anticipatory bereavement or fear their loved one's passing while appreciating the relief that may come with that transition. This state of emotional and motivational conflict is often ongoing, unrelenting, and likely occupying the minds of ICs. Findings consistently indicate that among cancer ICs, PNT accounts for a large portion of their overall distress [18−20] and prevents them from flexibly attending to salient cues in the environment and to emotions that arise in a contextually appropriate manner [21−23].

For example, previous research on cancer ICs has demonstrated that repetitive negative thinking may mediate the relationship between burden and depressive symptoms [24] and that ICs reported higher levels of distress caused by rumination compared to controls [25]. A study conducted by Gaugler, Eppinger, King, Sandberg, and Regine (2013) on coping strategies in cancer ICs found that those who experienced more problems coping with cancer care reported greater feelings of emotional exhaustion and fatigue, were more likely to feel trapped in their care responsibilities, and experienced greater feelings of guilt. Further, this study found that ICs who employed more negative expectation coping strategies (including worry, expecting the worst, and getting nervous) were more likely to report somatic and subjective anxiety and depressive symptoms [17]. Consequently, the distress experienced by cancer ICs is worsened and, in turn, may interfere with the care they provide to their loved one.

In our systematic review [23] of 49 psychosocial intervention studies for ICs, we highlighted the benefits of individual supportive interventions (versus with patients present or in group formats) and structured, manualized treatment (e.g., cognitive behavior therapy [CBT], interpersonal psychotherapy) to improve various aspects of psychosocial well-being for ICs. Such interventions also improved IC enrollment and retention, likely due to their sensitivity to

the many demands of caregiving that historically prevent ICs from engaging in psychosocial support [26]. However, our subsequent meta-analytic results revealed that although CBT is one of the most well-researched and efficacious psychosocial treatments for mood and anxiety disorders [27, 28], it has consistently failed to extend that efficacy into specifically reducing the anxiety and depression in ICs. Indeed, our meta-analysis found a small and significant effect of CBTs for ICs directly following treatment (Hedge's $g$ = 0.08, $p$ = .014), which disappeared when randomized controlled trials (RCTs) were evaluated alone ($g$ = 0.04, $p$ = .200) [29]. This finding may be due, in part, to a lack of targeted focus on the mechanisms underlying the central feature of distress caused by the patient's illness—notably, PNT. As such, psychosocial interventions that more focally conceptualize and target the distress of ICs seems warranted.

### Emotion Regulation Therapy

Emotion Regulation Therapy (ERT) is mechanism-targeted, experientially-oriented CBT that integrates traditional and contemporary CBT [30] and emotion-focused therapies [31]. Rooted in a framework that draws from basic and translational affect science, ERT was developed to improve treatment for conditions in which PNT is considered a crucial maintaining factor, such as in the case of caregiver distress.

As compared to more traditional CBTs, ERT is more explicit in the delineation of the functional role of emotions and underlying motivations ([32, 33]). Specifically, ERT promotes (i) increased emotional and behavioral awareness, (ii), emotion regulatory capacities, and (iii) engagement of new contextual learning repertoires [32]. Initially, ERT centers on developing mindfulness skills to encourage intentional, flexible responding to challenging emotions, such as anxiety, sadness, and anger. In particular, ERT utilizes mindful emotion regulation skills intended to improve attention regulation (e.g., shifting and sustaining attention on difficult emotional stimuli) and meta-cognitive regulation skills (e.g., decentering or the ability to observe items that arise in the mind with distance and perspective and reappraisal or the ability to reinterpret the meaning of events to change the emotional trajectory). Instead of responding reactively to intense emotional situations such as with criticism, rumination, or worry, patients are taught to respond "counteractively" by applying the mindfulness skills when they first notice the arising of difficult emotions and their underlying motivational cues. After learning the skills, ERT patients engage conflicting emotional/motivational states via imaginal exposure to feared possibilities, and dialogue tasks to encourage behavioral activation of desired affective states. The goal is to promote living "proactively," assisting patients in taking actions consistent with their values.

ERT has demonstrated considerable preliminary efficacy as well as initial support for the role of regulatory mechanisms using both behavioral and neural indices associated with ERT clinical outcomes (e.g., [34, 35]). In an open and randomized controlled trial of adults diagnosed with generalized anxiety, with or without co-occurring depression, patients evidenced gains on measures of PNT (e.g., worry, rumination) and reductions in trait anxiety, depressive symptoms, and quality of life [16, 33]. Similarly, a recent open trial demonstrated efficacy for a slightly shortened ERT format among a diverse sample of young adults diagnosed with an anxiety or mood disorder, with strong effect sizes for changes pre-to-post treatment in worry, rumination, generalized anxiety, anhedonic depression, clinician-rated severity of generalized anxiety disorder (GAD) and major depressive disorder (MDD), social disability, and quality of life (QOL) [35].

In its original format, ERT is delivered as 16 weekly in-person sessions. In ERT-C, we consolidated the treatment into eight sessions that were scheduled at times convenient to ICs to be sensitive to caregiving demands and reported barriers to psychosocial service use [36−38]. Given these considerations, the mindfulness skills and dialogue task were adapted to be optimally applicable to the cancer caregiving context, though the goals of the exercises remained the same. The separate modules train ICs in: (i) cue detection and delineation of problematic motivational (i.e., threat and/or loss-based) and regulatory (i.e., worry, rumination, self-criticism, reassurance seeking, avoidance/withdrawal, and/or compulsive behaviors) responses; (ii) attentional skills to increase the ability to broaden, shift, and sustain attention when distressed; (iii) meta-cognitive skills to more effectively distance and reframe emotional thoughts; and (iv) improving the ability to more flexibly engage contexts that are rewarding even when accompanied by loss/threat. To increase relatability and relevance for the cancer IC population, each module was updated to contain IC-specific examples with challenges common to the cancer caregiving context.

Given the high levels of PNT detected in ICs, combined with the preliminary efficacy of ERT, the purpose of this study was to evaluate the feasibility, acceptability, and preliminary effects of ERT-C in a sample of cancer ICs who were experiencing elevated distress in the presence of PNT. We assessed a broad array of clinical and theoretically motivated self-report measures to examine the potential impact of ERT-C.

## METHOD

### Participants

Participants were recruited from Memorial Sloan Kettering Cancer Center (MSK) through in-person at clinic appointments, via physician referral (i.e., physicians who encountered ICs notified study staff), and through informational flyers that were posted in clinic waiting rooms. Participants were: (i) at least 18 years of age; (ii) a self-reported current caregiver to a patient with any site/stage of cancer; (iii) able to read and understand English; and (iv) able to provide informed consent. Participants were excluded if they reported any of the following: (i) lifetime history of bipolar disorder, schizophrenia, schizoaffective disorder; (ii) presence of disorder that compromises comprehension of assessments or informed consent information (e.g., Alzheimer's disease, dementia); (iii) regular smoker (daily use); (iv) heavy drinker (regularly having more than 14 alcoholic beverages per week); and (v) engaging in night shift work. While not presented here, data collection also included psychoneuroimmunological (PNI) indicators of distress, including circulating biomarkers (via blood samples) and salivary cortisol. It was due to these indicators that the latter three exclusion criteria are listed, as these can confound PNI outcomes. Additionally, participants needed to meet cutoff criteria on the Distress Thermometer measure (DT; ≥4) [39] and either elevated rumination (Brooding Subscale of the Rumination Response Scale; ≥12) [40] or worry (Brief Penn State Worry Questionnaire; >15) [41].

### Procedure

Thirty-two individuals met this criterion for distress, provided informed consent, and were enrolled in this trial. Quantitative assessments were completed at baseline (T1) and after completion of ERT-C (T2). Additionally, a subset of treatment completers ($n$ = 10) completed semistructured interviews that explored how ERT-C attended to their unique experience of worry and rumination and ways in which ERT-C could more specifically target the emotion regulation needs of cancer ICs. We limited these interviews to 10 participants based on qualitative methodological standards for reaching data saturation [42]. By the 10th interview, we reached data saturation of themes based on participant reported experiences.

### Emotion Regulation Therapy for Cancer Caregivers

ERT-C is a manualized treatment for ICs and consists of eight weekly hour-long sessions delivered in person. Homework exercises are assigned after each session to facilitate the learning and consolidation of ERT-C skills. The session topics (and specific skills taught) are as follows: Session 1—Introduction to ERT-C (Cue detection/self-monitoring); Session 2—Attention Regulation (Orienting and Allowing); Session 3—Meta-Cognitive Emotion Regulation (Distancing and Courageous/Compassionate Reframing); Session 4—On-the-Spot Regulatory Responding; Sessions 5−7—Being Proactive (imaginal and in vivo exposure to desired and valued

actions); and Session 8—Consolidating Gains and Relapse Prevention.

Therapists were extensively trained in the rationale and principles of ERT-C as well as implementation in the cancer-related caregiving context. Training also entailed reviewing videos of prior therapy patients (i.e., patients in other trials who had received ERT for chronic anxiety and depression and consented to have video recordings of their sessions shared for training purposes), as well as role-plays focused on delivery of the core skills to be imparted and the setup and delivery of in-session exposure/behavioral activation tasks. Following training, therapists received weekly telephone and/or face-to-face supervision with prior review of audio-recorded sessions.

### Quantitative assessments

#### *Demographic form*
Demographic information including gender, age, race, ethnicity, education, employment, religious affiliation, and marital status was collected at baseline. Information regarding whether the patient and IC cohabitate, patient-IC relationship type (i.e., spouse, parent, etc.), length of caregiving (i.e., years caregiving, hours per week spent providing care), and patient-related information (i.e., site and stage of disease) was also collected.

#### *Distress Thermometer*
The DT [39] is a single-item visual analog scale used to screen cancer patients for the presence of psychological distress with a 0−10 range. The National Cancer Center Network (NCCN) Clinical Practice Guidelines for Distress Management recommend use of the DT, along with a 34-item problem checklist [43, 44]. An extensive research literature has documented the utility of the DT as a screening tool for oncology settings, and has identified a cutoff of 4 or greater for identifying clinically significant psychological distress [45, 46].

*Perseverative Negative Thinking* was assessed by two measures. Rumination was measured with the *Ruminative Response Scale* (RRS) [22] using the Brooding Subscale, which is composed of five items assessing the tendency toward repetitive, negative thinking (e.g., "I think about a recent situation, wishing it could have gone better"). Participants rate the frequency with which they use ruminative strategies using a 4-point Likert scale ranging from 1 (never) to 4 (always), and higher scores reflect higher frequencies of brooding. The RRS has demonstrated high internal consistency (α = 0.89) [22]. Worry was measured by the *Penn State Worry Questionnaire* (PSWQ) [47], a widely used 16-item measure of trait worry with scores ranging from 16 to 80 with higher scores indicating more pathological worry. The PSWQ has demonstrated high internal consistency (α = 0.93) [47].

*Caregiver Burden* was assessed by the *Caregiver Reaction Assessment* (CRA), a 24-item self-report measure that assesses multiple dimensions of caregiver burden, including self-esteem, family support, finances, schedule, and health. Items are rated on a 5-point Likert-type scale. The CRA has been used widely in studies with ICs of cancer patients [48−51], and has demonstrated good internal consistency (range α = 0.73−0.84) and construct validity [48, 52].

*Depression and Anxiety* was assessed using the *Hospital Anxiety and Depression Scale* (HADS) [53], a 14-item self-rated questionnaire with separate (7-item) depression and anxiety subscales. The HADS has been well tested as a measure of overall psychological distress in cancer populations, and has demonstrated good internal consistency (α = 0.83) [54] and strong test-retest reliability and validity [55].

*Emotion Regulation* was assessed using two measures. The *Difficulties in Emotion Regulation Scale* (DERS) [56] is a 36-item measure comprised of six subscale scores measuring difficulties with aspects of emotion regulation, including: acceptance of emotions, ability to engage in goal-directed behavior when distressed, impulse control, awareness of emotions, access to strategies for regulation, and clarity of emotions. The DERS has demonstrated good internal consistency (α = 0.93). The *Five Facet Mindfulness Questionnaire* (FFMQ) [57] is a 39-item self-report measure comprised of five factors (observing, describing, acting with awareness, nonjudging of internal experience, and nonreactivity to internal experience). The FFMQ has demonstrated good internal consistency (range α = 0.86−0.95) [58].

### Semistructured interview
Research staff members who did not serve as ERT-C therapists used a scripted interview guide that the research team developed iteratively. Its content and wording were reviewed by an IC, a qualitative methods expert, and a psychologist with experience working with ICs.

Study procedures were reviewed by the Memorial Sloan Kettering Institutional Review Board (approval number 15-219) and all participants provided informed consent before enrollment. The Clinical Trial Registration Number for this study is NCT02697357.

### Statistical Analysis
Descriptive statistics for demographic variables and measure scores are produced for all participants at pre-ERT assessment. To assess the effect of ERT-C on the outcomes described above, means and 95% confidence intervals are reported for measure scores for both time points as well as for the change scores of participants who completed both assessments. Noting the sample size limitations, we calculated Hedge's *g* statistic to estimate effect size across measures. Like Cohen's (1992) *d*, common effect

size conventions for Hedge's *g* are small = 0.20, medium = 0.50, large = 0.80 [57]. However, Hedge's *g* is preferable to Cohen's *d* especially in small samples as the effect size estimates are more reliably reproduced in larger samples [59].

Qualitative methods were employed to evaluate participant responses to the semistructured interview. Two study team members who did not conduct the interview were involved in the transcription and interpretive process. One member transcribed the interview, and the transcription was subsequently verified for fidelity by the other. The interview transcripts were then analyzed with a targeted inductive procedure of qualitative thematic text analysis. This involved thorough reading and review of transcripts by two members of the study team; synthesizing key conceptual findings from each transcript; identifying key conceptual findings across all transcripts; and generating descriptive and interpretive themes for the entire data set [60−63].

## RESULTS

Demographic characteristics of participants are presented in Table 1. Participants who completed the baseline assessment ($N$ = 31) were predominantly female (87%), White (77%) and married/partnered (81%), and on average 54 years old. The majority (61%) were the partner of the patient for whom they were providing care, whereas 19% identified as children and 16% as parents of patients with cancer. Three quarters (71%) of participants had provided care for their loved one since the time of diagnosis, which ranged from 3 to 83 months (average duration of caregiving was 27.6 months). More than half (58.1%) of participants reported annual incomes greater than $75,000 and nearly all had attained a college degree or postgraduate/professional experience (93.6%).

### Feasibility and Acceptability

There was moderate attrition from this pilot trial; 31% of enrolled participants did not complete all ERT-C sessions and 37.5% of participants did not complete the entire study (including the T2 assessment). Participant baseline characteristics and instrument scores did not meaningfully differ between attrition strata, with the exception of caregiver burden (CRA total scores for completers and non-completers at T1 were 76.90 and 84.64 [$p$ = .034]). In Fig. 1, we present the Trend data outlining participation in this trial.

Two key themes emerged from the semistructured interviews regarding feasibility and acceptability: ERT-C content and ERT-C delivery. In terms of ERT-C content, conceptual findings included feedback regarding the meditation exercises, the potential for ICs' loved ones to be involved in the therapy, and learning new concepts. Specifically, in terms of content, more than half of the participants interviewed liked the meditation scripts/audios and used

them throughout participation and after the conclusion of treatment. The majority of ICs interviewed appreciated the delivery of sessions individually and the opportunity to have space to process their unique experience, but also felt that it would be beneficial for the patient to join in at least one session so that they could address skills-building together. While almost all ICs interviewed found session material on being courageous and compassionate helpful, about 50% stated that talking about these concepts was much easier than putting them into practice, and that engaging in self-care was not something to which they were accustomed. For example, one participant stated, "I have plenty of physical courage, but do I have moral courage? That's harder, it's a question I ask myself often. Do I have the courage to face myself? Do I have sufficient compassion for myself to actually insist on taking care of myself?"

In terms of ERT-C delivery, conceptual findings included feedback regarding homework assignments, the timing/frequency of sessions, and the delivery of ERT-C in person. Specifically, ICs found the weekly homework exercises helpful and not burdensome to complete, and similarly found that engaging in weekly 1-hr sessions was feasible, and even suggested the possibility of additional sessions to allow for further refinement of skills. Moreover, while two participants stated that sessions conducted via telehealth (e.g., telephone, Skype) modalities would allow for greater flexibility with scheduling, all 10 ICs reported preferring and appreciating the face-to-face interaction and the benefit of the felt experience of being witnessed in person.

### Preliminary effects

In Table 2, we present the effect of ERT-C on overall and subscale scores.

#### *Depression and anxiety symptoms*

Patients receiving ERT-C evidenced substantial reductions in HADS depression, anxiety, and total scores with effect sizes reaching or surpassing medium effects.

#### *Perseverative negative thinking*

Patients receiving ERT-C evidenced meaningful reductions on both measures of negative self-referentiality with effect sizes approaching medium effects.

#### *Emotion regulation*

Patients receiving ERT-C evidenced strong reductions in emotion regulation deficits as well as gains in trait mindfulness with effect sizes approaching or exceeding conventions for large effects.

#### *Caregiver burden*

Patients receiving ERT-C endorsed a slight, nonsignificant increase in feelings of burden from T1 to T2. Although pre-ERT-C and post-ERT-C means

**Table 1** | Participant characteristics

| Characteristic | Mean (SD) | Frequency (%) |
|---|---|---|
| **Gender** | | |
| Male | | 4 (12.9) |
| Female | | 27 (87.1%) |
| **Age** | 54.45 (11.14) | |
| **Race/ethnicity** | | |
| African American/Black | | 1 (3.2) |
| Asian/Pacific Islander | | 1 (3.2) |
| Caucasian/White | | 24 (77.4) |
| Latino/Hispanic | | 2 (6.5) |
| Other | | 1 (3.2) |
| Two or more races | | 2 (6.5) |
| **Income** | | |
| $10,000 to $19,999 | | 1 (3.2) |
| $20,000 to $39,999 | | 1 (3.2) |
| $40,000 to $74,999 | | 5 (16.1) |
| $5,000 to $9,999 | | 1 (3.2) |
| $75,000 or more | | 18 (58.1) |
| Prefer not to answer | | 5 (16.1) |
| **Education level** | | |
| College degree | | 10 (32.3) |
| Professional or graduate school experience | | 19 (61.3) |
| Vocational school or some college | | 2 (6.5) |
| **Relationship status** | | |
| Married/partnered | | 25 (80.6%) |
| Divorced/separated | | 3 (9.7%) |
| Single/never married | | 3 (9.7%) |
| **Relationship to patient** | | |
| Parent | | 5 (16.1) |
| Spouse/partner | | 19 (61.3) |
| Child | | 6 (19.4) |
| Sibling | | 1 (3.2) |
| **Currently providing care** | | |
| Yes—constantly since diagnosis | | 22 (71) |
| Yes—on and off since diagnosis | | 6 (19.4) |
| Yes—stopped before but currently am | | 3 (9.7) |
| **Live with cancer patient** | | |
| Yes, all of the time | | 18 (58.1) |
| Yes, since his/her initial diagnosis | | 5 (16.1) |
| No | | 8 (25.8) |
| **Patient cancer type** | | |
| Brain | | 2 (6.5) |
| Breast | | 3 (9.7) |
| Colon or rectum | | 4 (12.9) |
| Esophagus | | 1 (3.2) |
| Leukemia/non-Hodgkin's lymphoma | | 2 (6.5) |
| Lung or bronchus | | 1 (3.2) |
| Ovarian | | 3 (9.7) |
| Pancreas | | 2 (6.5) |
| Prostate | | 1 (3.2) |
| Skin melanoma | | 1 (3.2) |
| Uterine | | 3 (9.7) |
| Other | | 4 (12.9) |
| More than one site | | 4 (12.9) |

**Table 1** | Continued

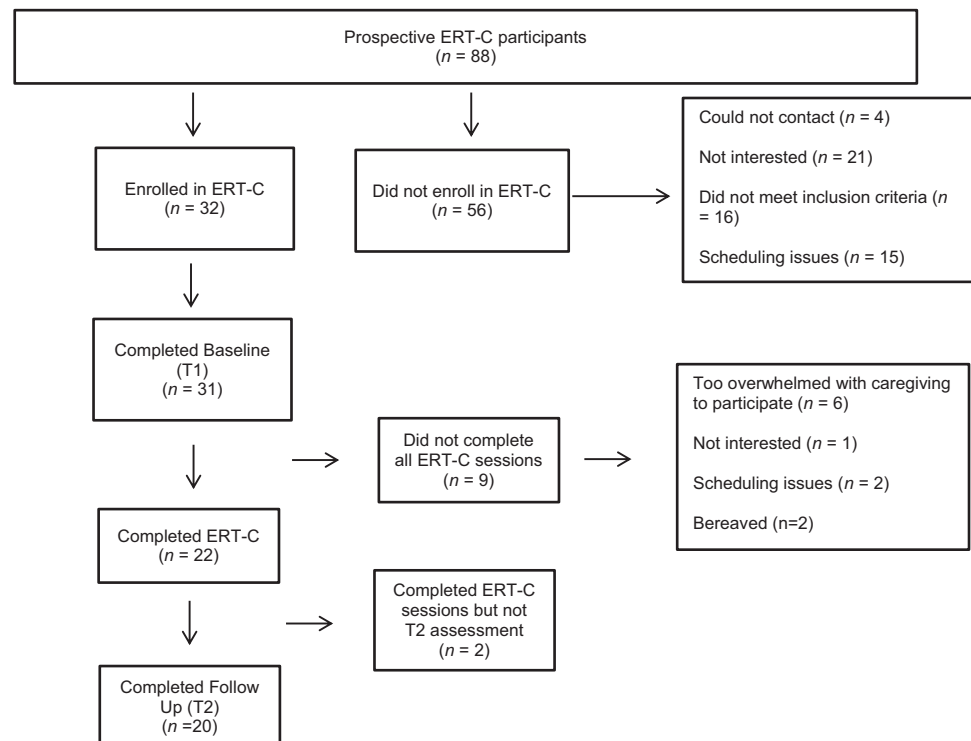| Characteristic | Mean (*SD*) | Frequency (%) |
|---|---|---|
| Patient cancer stage | | |
| Stage 1 | | 3 (9.7) |
| Stage 2 | | 3 (9.7) |
| Stage 3 | | 4 (12.9) |
| Stage 4 | | 16 (51.6) |
| Unstaged | | 3 (9.7) |
| Doesn't know | | 2 (6.5) |



**Fig 1** | Trend data.

indicate a decrease over time, treatment completers had lower baseline CRA scores and the differences for completers was a mean increase.

## DISCUSSION

This pilot trial of ERT-C provides strong support for the feasibility and acceptability of this approach to addressing distress in ICs, as well as the potential for ERT-C to lead to improvements in PNT in this population. ERT-C was well tolerated; only 31% of enrolled participants did not complete all ERT-C sessions and 37.5% of participants did not complete our T2 assessment. These rates are low compared to other investigations of interventions for ICs with similar doses (e.g., attrition rates between 57% and 75% reported [64]), and comparable to other studies conducted at the same institution with patients with advanced cancer and their ICs [65]. The success here in recruiting and retaining ICs in this in-person intervention is likely due, in part, to efforts made by

the treatment team to schedule sessions at times that were convenient for ICs, often concurrent when their loved ones' medical visits. These rates may also reflect the encouraging data derived from the in-depth interviews for the feasibility and acceptability of ERT-C. Not only did ICs find the material engaging and the in-session exercises beneficial, but too, recognized the benefits of completing homework assignments and practicing ERT-C skills in between sessions. Discussion of homework assignments has been inconsistently reported in previous similar trials with ICs [66–68], and these data serve as promising evidence for ICs' engagement with ERT-C exercises between sessions, which likely contributed to the improvements in PNT reported above. In a highly burdened population that historically underutilizes psychosocial services due to the many demands of caregiving, participants' reported desire for booster sessions and preference for in-person versus web-based delivery are indeed notable. Through its focus on the function of emotions and ICs' proactively

**Table 2 | Effect of ERT-C on measure and subscale scores**

| Measure | Pre-ERT-C, $n = 31$ Mean (95% CI) | Post-ERT-C, $n = 20$ Mean (95% CI) | Diff, $n = 20$ Mean (95% CI) | Hedge's $g$ | $p$-value |
|---|---|---|---|---|---|
| Depression and anxiety measures | | | | | |
| HADS total | 18.87 (16.51, 21.24) | 14.74 (12.28, 17.19) | −4.58 (−7.62, −1.54) | 0.65 | .009 |
| HADS anxiety | 11.55 (10.36, 12.74) | 9.37 (7.98, 10.76) | −2.74 (−4.40, −1.08) | 0.66 | .005 |
| HADS depression | 7.32 (5.79, 8.85) | 5.37 (4.02, 6.72) | −1.84 (−3.53, −0.16) | 0.49 | .046 |
| Perseverative negative thinking measures | | | | | |
| Rumination (Brooding) Scale | 45.74 (41.65, 49.83) | 42.68 (39.58, 45.79) | −3.89 (−6.91, −0.88) | 0.36 | .006 |
| Penn State Worry Questionnaire | 54.77 (49.95, 59.6) | 48.68 (43.88, 53.49) | −8.79 (−12.85, −4.73) | 0.47 | <.001 |
| Emotion regulation measures | | | | | |
| Difficulties in emotion regulation | 81.94 (74.32, 89.55) | 68.37 (61.17, 75.57) | −13.42 (−20.19, −6.65) | 0.68 | .001 |
| Five Facet Mindfulness Questionnaire | 126.87 (121.0, 132.7) | 143.95 (134.7, 153.2) | 17.42 (10.78, 24.06) | −0.92 | <.001 |
| Caregiver measure | | | | | |
| Caregiver Reaction Assessment[a] | 79.65 (76.4, 82.89) | 78.35 (75.08, 81.62) | 1.45 (−3.00, 5.90) | 0.15 | .531 |

*ERT-C* Emotion Regulation Therapy for Cancer Caregivers; *HADS* Hospital Anxiety and Depression Scale.
[a]Pre-ERT-C CRA scores were significantly higher for participants who did not complete post-ERT-C assessments; thus, the cross-sectional means appear to indicate a decrease, whereas the change score for completers is an increase.

taking actions consistent with their values, ERT adapted for the unique setting of cancer caregiving may feel more consonant with ICs' experiences and hence may reflect a more meaningful approach than traditional CBTs for this uniquely burdened population. Importantly, despite the success reported here in recruiting and retaining ICs, these rates also highlight the continued challenges of maintaining IC in in-person psychotherapy and engaging them after they have completed sessions. In future studies, efforts will be needed to understand the specific factors that contribute to attrition at various time points and identify strategies to maintain ICs in trials once active treatment has been completed.

This trial of ERT-C provides preliminary evidence for ERT-C in addressing multiple domains of IC well-being. Specifically, ERT-C evidenced meaningful reductions in depressive and anxious symptomatology, PNT, and emotion regulation deficits. To date, interventions have been generally unsuccessful in mitigating the anxiety and depression symptomatology that is so common among ICs, which may be due largely in part to their not addressing the core mechanisms underlying these symptom clusters. Indeed, our meta-analytic results for CBTs for ICs found only small effect sizes for reductions in anxiety and depression, which disappeared when RCTs were evaluated alone [29]. Here, ERT-C evidenced notably larger and significant reductions in anxiety and depression as well as worry and rumination (i.e., medium effect sizes) and improved participants' emotion regulation skills (i.e., large effect sizes). These results in the context of a single-arm design provide preliminary evidence

of ERT-C as a potentially more efficacious intervention than previous CBTs for ICs, and a comparable one to CBTs delivered to individuals seeking treatment for mood and anxiety disorders [27, 28]. The caregiving experience is marked by chronic uncertainty and hence, a critical task for ICs is to manage this uncertainty. Improvement in these emotion regulation skills likely allowed participants to manage the day-to-day challenges and uncertainties with less distress and related elevations in anxiety and depression symptoms.

ERT-C did not evidence significant reductions in IC burden. Although perhaps surprising against the backdrop of our other positive findings, the attenuated impact of ERT-C on burden is understandable when we consider the various determinants of burden and the range of variables comprised in the CRA. Burden reflects a "multidimensional biopsychosocial reaction resulting from an imbalance of care demands relative to caregivers' personal time, social roles, physical and emotional states, financial resources, and formal care resources given the other multiple roles they fulfill" [69]. In addition to addressing the emotional components of burden (e.g., anxiety, depression), the CRA assesses social support, finances, schedule, and physical health. Although it is possible that enhanced emotion regulation skills over long periods may contribute to improvements in some of these areas, we would not anticipate an impact on all of the unique domains of burden within 2 months of completing of ERT-C. Additionally, the majority of our participants were caring for patients with advanced (51.6% Stage 4, 12.9% Stage 3) cancers and were in spousal

relationships to patients, factors which likely contributed to the burden of care documented here [70–72]. Moreover, in the caregiving literature, the "concurrence of meaning and suffering" is often discussed [73], in that despite increased burden (e.g., schedule disruptions, financial toxicity, ICs' own medical problems), the possibility of greater emotional well-being may be attainable. Our data serve as evidence of this experience.

### Limitations

Several limitations of this investigation must be acknowledged. First, this study is limited by its sample size and noncontrolled design. Second, our participants were primarily non-Hispanic Whites and of higher socioeconomic status, thereby restricting the generalizability of findings. Our participants were also overwhelmingly female, though this sample composition is not significantly different from other trials of ICs across the USA. Nonetheless, future trials of ERT-C may wish to oversample male ICs to examine whether gender moderates treatment outcomes. Third, participants who dropped out of ERT-C reported significantly higher IC burden at baseline than those who completed all ERT-C sessions. As such, our participant sample likely did not fully capture the range and complexity of caregiving experiences. Fourth, only 10 participants engaged in in-depth semistructured interviews about their experiences in ERT-C. As these 10 participants were also treatment completers, this small sample failed to capture meaningful data regarding causes of attrition and the range of experiences in the trial. Finally, we relied on participant report of patient medical characteristics instead of medical chart review to determine eligibility (i.e., current IC to a patient enrolled at MSK). Although exploration of patient's disease site and stage, treatment type, and prognosis were not variables of interest in the current investigation, such data would have allowed for the determination of potential impact of stage in caregiving trajectory on outcomes in ERT-C.

### Future Directions

Further research is needed to establish the efficacy of ERT-C using a RCT design comparing ERT-C to either standard care or a comparable supportive care. Toward this end, we are currently conducting a RCT of ERT-C delivered to lung and colorectal cancer ICs in Denmark (Clinical Trial Registration Number NCT02322905), and plan to conduct a correlate study here in the USA with ICs of patients with all sites and stages of cancer. Future studies should include longer follow-up periods and larger sample sizes which will allow for richly assessing psychological-as well as biological and physiological-mechanisms underlying the changes resulting from ERT-C. Such studies should also systematically examine the contribution of caregiver burden to study enrollment and retention. Additionally, once the efficacy of ERT-C

has been established in the context of a RCT, an important future direction will be to evaluate the delivery of ERT-C via telehealth modalities to facilitate delivery to a larger and more diverse sample of ICs.

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